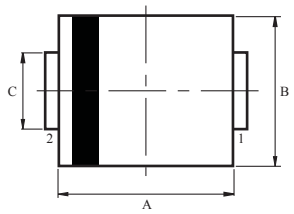
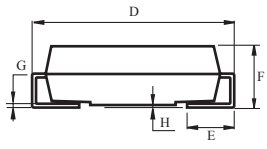
Transient Voltage Suppressor Diode

PG24MSSMC

PG24MSSMC is designed suitable to protect sensitive automotive circuits against surges defined in ISO 7637-2 and against electrostatic discharges according to IEC 61000-4-2. So it has high reliability and low clamping voltage.

PACKAGE DIMENSION(SMC)





DIM	MILLIMETERS
A	6.86±0.26
B	5.91±0.32
C	3.00±0.08
D	7.94±0.19
E	1.14±0.38
F	2.31±0.31
G	0.23±0.38
H	0.10±0.10

1. ANODE
2. CATHODE

FEATURES

- 5,000 Watts peak pulse power capability with a 10/1,000us waveform
- Excellent clamping voltage
- Unidirectional-type
- Package size : 6.86 X 5.91 X 2.31mm^3
- Pb-Free, Halogen-Free, RoHS compliant
- Suffix U: Qualified to AEC-Q101
  ex) PG24MSSMC-RTF/HU
- Transient protection for automotive circuit and sensitive electronic equipment
  - IEC61000-4-2(ESD) : Air mode ±30kV / Contact mode ±30kV
  - ISO7637-2(Pulse 1 IV, 2a/2b IV, 3a/3b IV)

Table 1. Test pulse severity level of nominal 12V, 24V

Test Pulse	Nominal 12V system test pulse severity level			Nominal 24V system test pulse severity level			Min. number of pulses or test time	Burst cycle / pulse repetition time	
	IV	III	I / II	IV	III	I / II	-	Min	Max
1	-150	-112	-75	-600	-450	-300	500 pulse	0.5s	*e
2a	+112	+55	+37	+112	+55	+37	500 pulse	0.2s	5s
2b	+10	+10	+10	+20	+20	+20	10 pulse	0.5s	5s
3a	-220	-165	-112	-300	-220	-150	1h	90ms	100ms
3b	+150	+112	+75	+300	+220	+150	1h	90ms	100ms

*e) The maximum pulse repetition time shall be chosen such that it is the minimum time for the DUT to be correctly initialized before the application of the next pulse and shall be ≥ 0.5s

MECHANICAL DATA

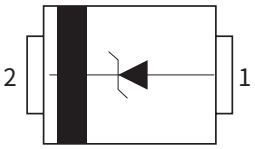
- Package : SMC
- Molding compound flammability rating : UL94V-0
- Moisture sensitivity : level 1, per J-STD-020
- Terminal leads plating : Matte tin with lead-free, solderable per JESD22-B102
- Polarity indicator : Cathode band
- Weight : ≒0.29grams

APPLICATION

- Motor control
- Inside cabin(lighting)
- Headlamps(lighting)
- ECU(lighting)
- E-call
- Engine cooling system
- Infotainment and navigation
- Camera
- Remote keyless entry
- On-board battery charger
- Battery management system
- Vehicle communication
- Power line

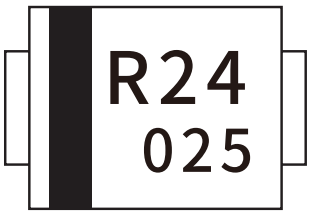
PIN CONFIGURATION

SMC(SMD-Type)



1. ANODE 2. CATHODE

MARKING CODE



ORDERING INFORMATION

PART NUMBER	QTY PER REEL	REEL SIZE
PG24MSSMC-RTF	3,000 pcs	13 inch

MAXIMUM RATING (Ta=25℃)

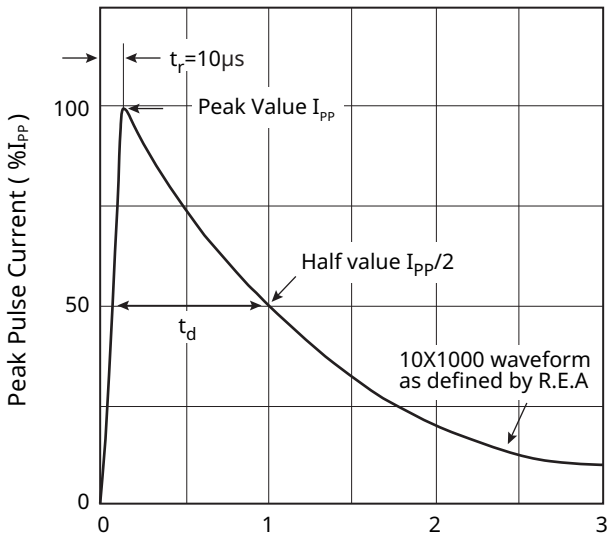
CHARACTERISTIC		SYMBOL	RATING	UNIT
Peak Pulse Power with 10/1,000μs waveform at Ta=25℃	(Note 1, Note 2, Fig 1)	P_{PK}	5,000	W
Peak Pulse Current with 10/1,000μs waveform at Ta=25℃	(Note 1, Note 2, Fig 1)	I_{PP}	129	A
Peak forward surge current with 8.3ms single half sine wave	(Note 1, Note 2)	I_{FSM}	300	A
Junction Temperature		T_J	150	℃
Operating Junction Temperature		T_{opr}	-40 ~ 150	℃
Storage Temperature		T_{STG}	-40 ~ 150	℃

Note 1) Non-repetitive pulse
Note 2) Mounted on a pad dimension 5 X 5mm to each terminals in FR-4 glass epoxy board of 20 X 20mm

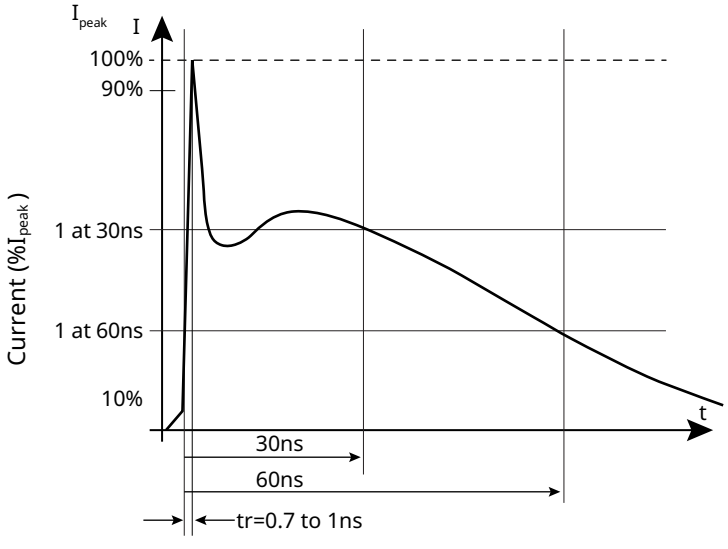
THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	VALUE	UNIT
Thermal Resistance(Note2)	$R_{th(j-a)}$	Junction to Ambient	Typ 75	℃/W

Note 2) Mounted on a pad dimension 5 X 5mm to each terminals in FR-4 glass epoxy board of 20 X 20mm

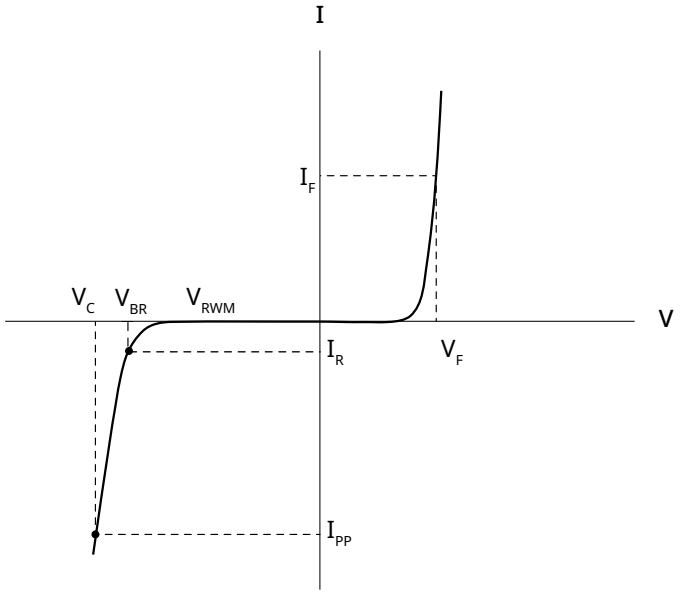


td, Time(ms)
Fig.1 Pulse waveform



t, Time(ns)
Fig.2 An idealized ESD pulse
according to the IEC 61000-4-2 Standard

DEFINITIONS OF ELECTRICAL CHARACTERISTICS SYMBOL



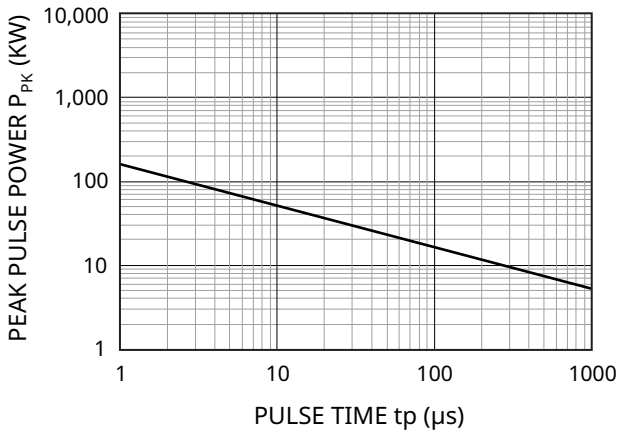
V_{RWM}	Maximum voltage rated for DC operating voltage
I_R	The maximum leakage current is the maximum current measured at the working voltage
V_{BR}	The breakdown voltage is the minimum reverse voltage that makes the diode conduct appreciably in reverse
Y_Z	Variation value of voltage due to temperature change
V_C	Maximum voltage drop during going to I_{PP} (Limited voltage)
R_{DYN}	Current fluctuation rate / voltage fluctuation rate
C_T	Capacitance of device
V_{ESD}	A discharge voltage in which a finite amount of charge rapidly moves between two objects having different potentials

ELECTRICAL CHARACTERISTICS (Ta=25°C)

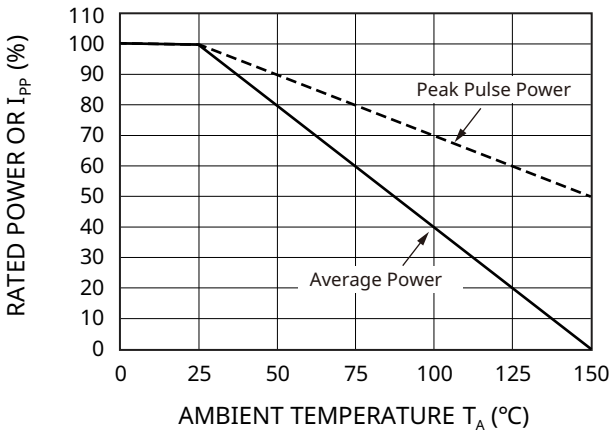
CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Reverse Stand-Off Voltage	V_{RWM}	-		-	-	24	V
Reverse Leakage Current	I_R	V_R=24V		-	-	100	nA
Breakdown Voltage	V_{BR}	I_T=1mA		26.7	-	29.5	V
Temperature Coefficient (Note 2)	Y_Z	I_T=1mA (@Ta=25 to 85°C)		-	20	-	mV/°C
Clamping Voltage (Note 1, Fig 1)	V_{C1}	I_{PP1}=1A, tp=10/1,000μs		-	-	30.2	V
	V_{C2}	I_{PP2}=129A, tp=10/1,000μs		-	-	38.9	V
Dynamic Resistance	R_{DYN}	$(V_{C2} - V_{C1}) / (I_{PP2} - I_{PP1})$		-	0.02	-	Ω
Total Capacitance	C_T	V_R=0V, f=1MHz		-	-	5,000	pF
Electrostatic Discharge (Note 1, Fig 2)	V_{ESD}	IEC61000-4-2	Air	±30	-	-	kV
			Contact		-	-	

Note 1) Non-repetitive pulse
Note 2) Mounted on a pad dimension 5 X 5mm to each terminals in FR-4 glass epoxy board of 20 X 20mm

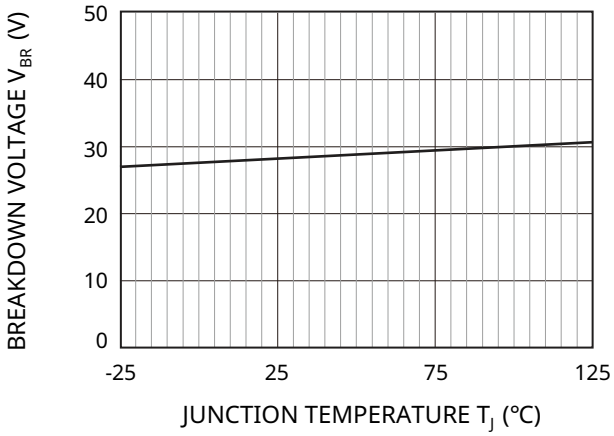
NON-REPETITIVE PEAK PULSE POWER VS. PULSE TIME



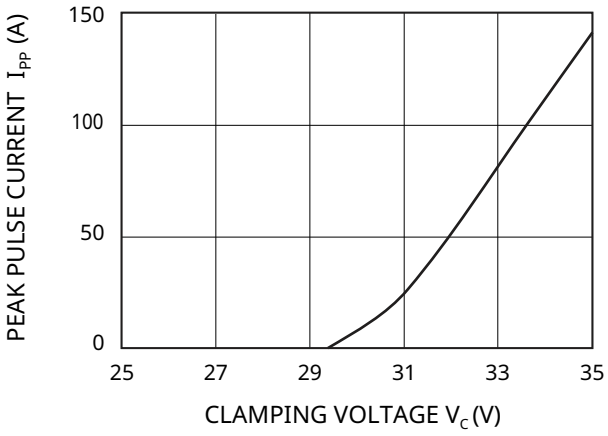
POWER DERATION CURVE



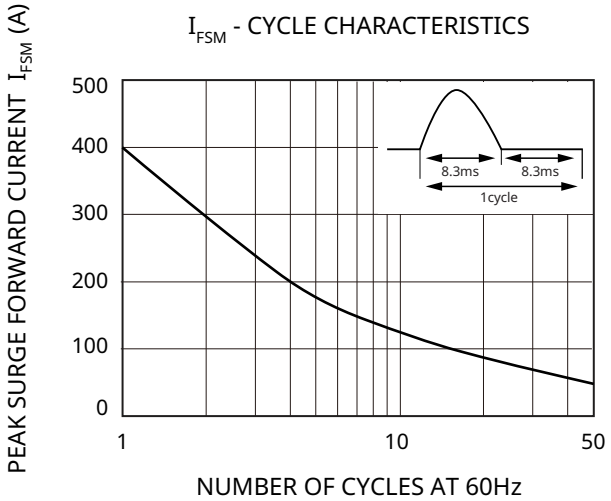
BREAKDOWN VOLTAGE VS. JUNCTION TEMPERATURE



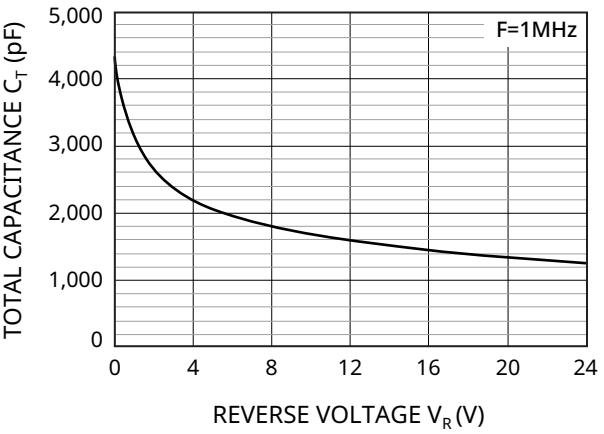
PEAK PULSE CURRENT VS. CLAMPING VOLTAGE

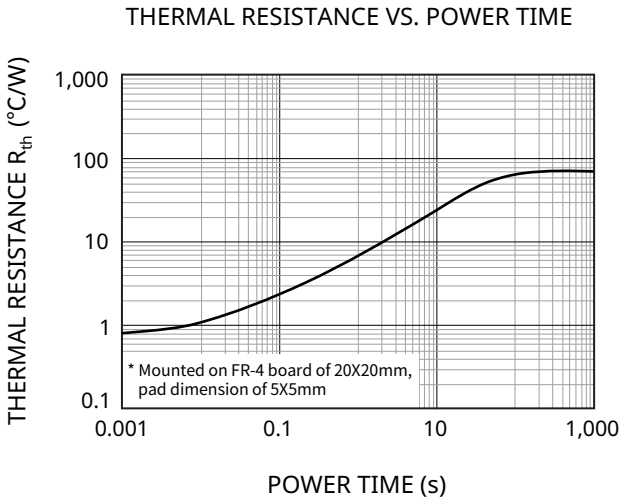


I_{FSM} - CYCLE CHARACTERISTICS

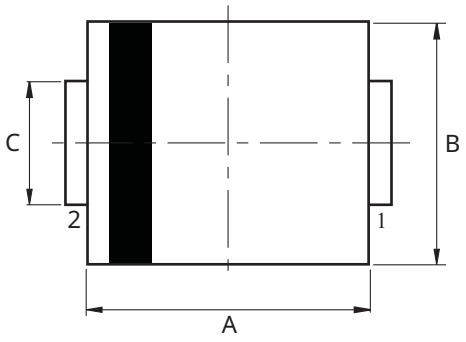


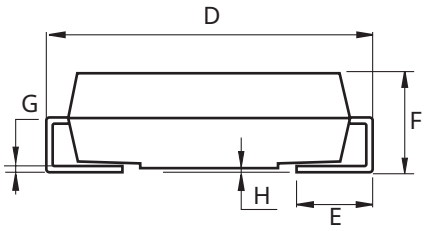
TOTAL CAPACITANCE VS. REVERSE VOLTAGE





PACKAGE DIMENSION(SMC)





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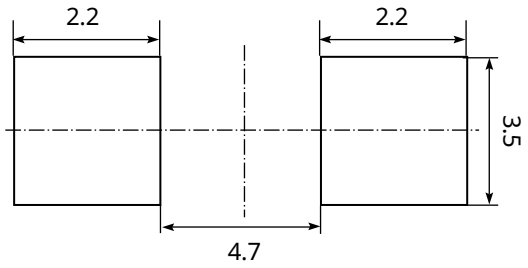
RECOMMENDED PAD DIMENSION

Unit: mm



PRECAUTION ON USING KEC PRODUCTS

1. The products described in this data are intended to be used in general-purpose electronic equipment (Office equipment, telecommunication equipment, measuring equipment, home appliances)

2. When you intend to use these products with equipment or device which require an extremely high of reliability and special applications (such as automobile, air travel aerospace, transportation equipment, life support, system and safety devices) in which special quality and reliability and the failure or malfunction of products may directly jeopardize or harm the human body or damage to property and any application other than the standard application intended, please be sure to consult with our sales representative in advance.

3. On designing your application, please use product within the ranges guaranteed by KEC for maximum rating, operating supply voltage range, heat radiation characteristics and other characteristics. User shall be responsible for failure or damage when used beyond the guaranteed ranges.

4. The technical information described in this data is limited to showing representative characteristics and applied circuit examples of the products and it does not constitute the warranting of industrial property, the granting of relative rights, or the granting of any license.

5. What are described in the data may be changed without any prior notice to reflect new technical development. Please confirm that you have received the latest product standards or specification before final design, purchase or use.

6. Although KEC is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors. Therefore, in order to prevent personal injury or fire arising from failure, please take safety measures such as complying with the derating characteristics, implementing redundant and fire prevention designs, and utilizing backups and fail-safe procedures. KEC shall have no responsibility for any damages arising out of the use of our Products beyond the rating specified by KEC.

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